O I P E JC64
JUN 10 2004
PATENT & TRADEMARK OFFICE

IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application
Inventor(s): Thomas F. Rust
Appln. No.: 10/685,045
Confirm. No.: 5702
Filed: October 14, 2003
Title: PHASE CHANGE MEDIA FOR HIGH DENSITY DATA STORAGE

PATENT APPLICATION

Art Unit: 2824
Examiner: Pho M. Luu

Customer No. 23910

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

I hereby certify that this correspondence is being deposited in the United States Postal Service with sufficient postage as first class mail in an envelope addressed to **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**, on June 7, 2004.

(Attorney Signature)

Michael L. Robbins, Reg. No. 54,774
Signature Date: June 7, 2004

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.56

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

It is requested that the information identified in this statement be considered by the Examiner and made of record in the above-identified application. This statement is not intended to represent that a search has been made or that the information cited in the statement is, or is considered to be, material to patentability as defined in 37 C.F.R. §1.56. If this is a continuation, divisional or continuation-in-part application, it is understood that the Examiner will consider all information which was considered by the Office in a parent application. MPEP §609. Such information therefore is not listed herein unless it is desired that the information be printed on a patent issuing from the subject application.

Enclosed with this statement are the following:

✓ Form PTO-1449. The Examiner is requested to initial the form and return it to the undersigned in accordance with M.P.E.P. §609.

✓ The present application is being/was filed after June 30, 2003. In accordance with the pre-official gazette waiver of 37 CFR 1.98 (a)(2)(i) posted at: pac/dapp/opla/preognotice/idswouscopies.htm, copies of cited U.S. patents and publications are not enclosed. However, copies of cited foreign patent documents and non-patent literature are enclosed in accordance with 37 CFR 1.98(a)(2), as still required, except for those items designated by an asterisk (*), which were previously submitted by the applicant in a parent application, from which benefit under 35 U.S.C. §120 is claimed, with an *Information Disclosure Statement* submitted in the parent application which complies with the

September 8, 2000 or subsequent revision of 37 C.F.R. §1.98(a-c), as allowed under 37 C.F.R. §1.98(d)(1).

___ The present application was filed prior to June 30, 2003. A copy of each cited document as required by 37 C.F.R. §1.98 is enclosed, except for those items designated by an asterisk (*), which were previously submitted by the applicant in a parent application, from which benefit under 35 U.S.C. §120 is claimed, with an *Information Disclosure Statement* submitted in the parent application which complies with the September 8, 2000 or subsequent revision of 37 C.F.R. §1.98(a-c), as allowed under 37 C.F.R. §1.98(d)(1).

___ If any of the cited/submitted documents is in a foreign language, a concise explanation of relevance is provided pursuant to 37 C.F.R. §1.98(a)(3)(i). For foreign language documents cited in a search report by a foreign patent office, the requirement for a concise explanation of relevance is satisfied by the submission herewith of an English language version of the search report. MPEP §609A(3). If a written English-language translation of a non-English language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in §1.56(c), a copy of the translation accompanies this statement, 37 C.F.R. §1.98(a)(3)(ii), and satisfies the requirement for a concise explanation of relevance, MPEP §609A(3).

___ ***PTA Statement under 37 C.F.R. §1.704(d).*** Each item of information contained in the *Information Disclosure Statement* was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in §1.56(c) more than thirty days prior to the filing of the *Information Disclosure Statement.*

This statement should be considered because:

✓ **37 C.F.R. §1.97(b).** This statement qualifies under 37 C.F.R. §1.97, subsection (b) because:

(1) It is being filed within three months of the filing date of an application other than a continued prosecution application under § 1.53(d);

-- OR --

(2) It is being filed within 3 months of entry of a national stage;

-- OR --

(3) It is being filed before the mailing date of the first Office Action on the merits,

-- OR --

(4) It is being filed before the mailing date of the first Office Action after the filing of a Request for Continued Examination under 37 C.F.R. §1.114.

___ **37 C.F.R. §1.97(c).** Although it may not qualify under subsection (b), this statement qualifies under 37 C.F.R. §1.97, subsection (c) because:

(1) It is being filed before the mailing date of a FINAL Office Action, a Notice of Allowance, or an action that otherwise closes prosecution in the subject application, whichever occurs first.

-- AND *(check at least one of the following)* --

___ (1) It is accompanied by a STATEMENT as set forth in 37 C.F.R. §1.97(e).
-- OR --
___ (2) It is accompanied by the $180 fee set forth in 37 C.F.R. §1.17(p).

_ **37 C.F.R. §1.97(d).** Although it may not qualify under subsection (b) or (c), this statement qualifies under 37 C.F.R. §1.97, subsection (d) because:

(1) It is being filed on or before payment of the Issue Fee;
-- AND --
(2) It is accompanied by a STATEMENT as set forth in 37 C.F.R. §1.97(e);
-- AND --
(3) It is accompanied by the $180 fee set forth in 37 C.F.R. §1.17(p).

✓ ***Fee Authorization.*** The Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account No. 06-1325. A duplicate copy of this authorization is enclosed.

Respectfully submitted,

FLIESLER MEYER LLP

Date: 6/7/04 By: ______________________
Michael L. Robbins
Reg. No. 54,774

FLIESLER MEYER LLP
Four Embarcadero Center, Fourth Floor
San Francisco, California 94111-4156
Telephone (415) 362-3800

OIPE JC64
JUN 10 2004
PATENT & TRADEMARK OFFICE

Sheet ____ of ____

Form PTO-1449 *(Substitute)* U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE *Information Disclosure Statement* **BY APPLICANT** *(Use several sheets if necessary)*	Attorney Docket Number LAZE-01019US1	Serial/Patent Number 10/685,045
	Applicant/Patent Owner Thomas F. Rust	
	Filing/Issue Date October 14, 2003	Group Art Unit 2824

U.S. PATENTS

Examiner Initial		Patent Number	Issue Date	First Named Inventor	Class	Subclass	Filing Date
	1	4,340,953	07/20/82	Iwamura et al.	369	126	05/07/80
	2	4,575,822	03/11/86	Quate	365	174	02/15/83
	3	4,829,507	05/09/89	Kazan et al.	369	126	08/15/88
	4	4,831,614	05/16/89	Duerig et al.	369	101	03/13/87
	5	4,916,688	04/10/90	Foster et al.	369	126	03/31/88
	6	4,945,515	07/31/90	Ooumi et al.	365	174	09/12/88
	7	4,962,480	10/09/90	Ooumi et al.	365	151	09/12/88
	8	4,987,312	01/22/91	Eigler	250	492.3	11/07/89
	9	5,038,322	08/06/91	Van Loenen	365	114	02/03/89
	10	5,043,578	08/27/91	Guethner et al.	250	307	04/05/90
	11	5,051,977	09/24/91	Goldberg	369	126	08/30/89
	12	5,091,880	02/25/92	Isono et al.	365	151	01/29/90
	13	5,095,479	03/10/92	Harigaya et al.	369	288	08/12/91
	14	5,097,443	03/17/92	Kaneko et al.	365	153	03/28/90
	15	5,144,148	09/01/92	Eigler	250	492.3	08/07/90
	16	5,187,367	02/16/93	Miyazaki et al.	250	306	08/08/91
	17	5,216,631	06/01/93	Sliwa, Jr.	365	174	11/02/90
	18	5,251,200	10/05/93	Hatanaka et al.	369	126	09/11/91
	19	5,260,567	11/09/93	Kuroda et al.	250	227.19	04/08/92
	20	5,262,981	11/16/93	Rabe et al.	365	120	07/01/91
	21	5,265,046	11/23/93	Fuchs et al.	365	151	12/30/91
	22	5,289,455	02/22/94	Kuroda et al.	369	126	07/23/91

U.S. PATENTS

Examiner Initial		Patent Number	Issue Date	First Named Inventor	Class	Subclass	Filing Date
	23	5,307,311	04/26/94	Sliwa, Jr.	365	174	02/09/93
	24	5,323,375	06/21/94	Ihara et al.	369	126	03/09/92
	25	5,335,197	08/02/94	Kaneko et al.	365	153	12/10/91
	26	5,389,475	02/14/95	Yanagisawa et al.	430	019	06/18/92
	27	5,412,597	5/02/95	Miyazaki et al.	365	174	10/15/93
	28	5,446,684	08/29/95	Kaneko et al.	365	046	05/10/94
	29	5,453,970	09/26/95	Rust et al.	369	176	07/13/93
	30	5,471,064	11/28/95	Koyanagi et al.	250	452.2	09/14/93
	31	5,471,458	11/28/95	Oguchi et al.	369	126	09/08/93
	32	5,557,596	09/17/96	Gibson et al.	369	101	07/12/95
	33	5,606,162	02/25/97	Buser et al.	250	306	07/01/96
	34	5,751,685	05/12/98	Yi	369	126	05/10/96
	35	5,778,134	07/07/98	Sakai et al.	386	046	09/03/96
	36	5,804,710	09/08/98	Mamin et al.	073	105	06/05/97
	37	5,808,973	09/15/98	Tanaka	369	14	09/06/96
	38	5,822,285	10/13/98	Rugar et al.	369	44.26	03/31/97
	39	5,835,477	11/10/98	Binning et al.	369	126	07/10/96
	40	5,848,077	12/08/98	Kamae et al.	371	053	12/08/95
	41	5,856,967	01/05/99	Mamin et al.	369	126	08/27/97
	42	5,929,438	07/27/99	Suzuki et al.	250	306	01/16/97
	43	5,953,306	09/14/99	Yi	369	126	04/25/97
	44	6,001,519	12/14/99	Yang et al.	430	020	07/02/98
	45	6,027,951	02/22/2000	MacDonald et al.	438	020	08/18/98
	46	6,038,916	03/21/00	Cleveland et al.	073	105	07/22/97
	47	6,196,061	03/06/2001	Adderton et al.	073	105	11/05/98
	48	6,275,410 B1	08/14/2001	Morford	365	151	11/09/2000
	49	6,339,217	01/15/2002	Kley	250	216	07/28/95

U.S. PATENTS

Examiner Initial		Patent Number	Issue Date	First Named Inventor	Class	Subclass	Filing Date
	50	6,507,552 B2	01/14/2003	Gibson	369	126	12/01/2000
	51	6,522,566 B2	02/18/2003	Carter	365	118	12/01/2000
	52	6,542,400 B2	04/01/2003	Chen et al.	365	151	03/27/2001

U.S. PATENT PUBLICATIONS

Examiner Initial		Patent Application Publication Number	Publication Date	Applicant
	53	US 2002/0110074 A1	08/15/2002	Gibson
	54	US 2002/0135917 A1	09/26/2002	Davidson
	55	US 2003/0007443 A1	01/09/2003	Nickel
	56	US 2003/0081532 A1	05/01/2003	Gibson
	57	US 2003/0185139 A1	10/02/2003	Ives
	58	US 2003/0189200 A1	10/09/2003	Lee et al.

PENDING U.S. PATENT APPLICATIONS

Examiner Initial		Application Number	Filing Date	First Named Inventor	Petition to Expunge? Yes	No

FOREIGN PATENT DOCUMENTS

Examiner Initial		Document Number	Publication Date	Country	Class	Subclass	Translation Yes	No
	59	WO 96/11472	04/18/96	PCT				
	60	JP3295043	12/26/91	JAPAN			X	
	61	JP3295044	12/26/91	JAPAN			X	
	62	JP4159636	06/02/92	JAPAN			X	

OTHER DOCUMENTS (Include author (if any), title, publisher and place of publication, date and pertinent pages)		
	63	*BO HONG, Exploring the Usage of MEMS-based Storage as Metadata Storage and Disk Cache in Storage Hierarchy,* Storage Systems Research Center, Jack Baskin School of Engineering, University of California at Santa Cruz http://www.cse.ucsc.edu/~hongbo/publications/mems-metadata.pdf
	64	*SUMIO HOSAKA, HAJIME KOYANAGI AND ATSUSHI KIKUKAWA,* Nanometer Recording on Graphite and Si Substrate Using an Atomic Force Microscope in Air, Japan Journal of Applied Physics, Volume 32 (1993) pp. L464-467, Part 2, No. 3B, March 15, 1993, Central Research Laboratory, Hitachi Limited, Kokubunji, Tokyo 185
	65	*ATSUSHI KIKUKAWA, SUMIO HOSAKA, YUKIO HONDA[1] and RYO IMURA,* Phase-Controlled Scanning Force Microscope, Japanese Journal of Applied Physics, Volume 33 (1994) pp. L1286-L1288, Part 2, No. 9A, September 1, 1994, Advanced Research Laboratory, Hitachi Limited, 1-280 Higashi-koigakubo, Kokubunji-shi, Tokyo 185, [1]Central Research Laboratory, Hitachi Limited, 1-280 Higashi-koigakubo, Kokubunji-shi, Tokyo 185
	66	*WILLIAM P. KING, DANIEL A. FLETCHER and Y. SUNGTAEK JU,* Nanometer-Scale Thermal Processing for Advanced Manufacturing (YIP '96), Office of Naval Research Annual Grant Report, First Annual Report: May 1, 1996 - April 30, 1997, pp. 1 - 8
	67	*T. C. REILEY, T.R. ALBRECHT, D. W. ALBRECHT, K. KUROKI and M. AOYAGI,* A Micro Hard Disk Drive, I.B. M. - Almaden Research Center, I.B.M. Storage System Division, Electrochemical Society Proceeding, Volume 98-20, pp. 10 - 18
	68	*SEIJI HEIKI, YASUO WADA and TOMIHIRO HASHIZUME,* Correlation Between Tip-Apex Shape and Surface Modification by Scanning Tunneling Microscopy, Journal of Applied Physics, Vol. 86, No. 8, pp. 4220 - 4224
	69	*MICHAEL BROOKS,* Hole in One, New Scientist, March 27, 1999, pp. 46 - 48
	70	*H. JONATHON MAMIN, ROBERT P. RIED, BRUCE D. TERRIS and DANIEL RUGAR,* High-Density Data Storage Based on the Atomic Force Microscope, Proceeding of the IEEE, Volume 87, No. 6, June 1999, pp. 1014 - 1027
	71	*STEVEN W. SCHLOSSER, JOHN LINWOOD GRIFFIN, DAVID F. NAGLE, AND GREGORY R. GANER,* Filling the Memory Access Gap: A Case for On-Chip Magnetic Storage, School of Computer Science, Carnegie Mellon University, November 1999
	72	*STEVEN W. SCHLOSSER, JOHN LINWOOD GRIFFIN, DAVID F. NAGLE and GREGORY R. GANGER,* Carnegie Mellon University, Designing Computer Systems with MEMS-Based Storage, 9th International Conference on Architectural Support for Programming Languages and Operating Systems, 2000
	73	*S. HOSAKA, K. ETOH, A. KIKUKAWA AND H. KOYANAGI,* Megahertz Silicon Atomic Force Microscopy (AFM) Catilever and High-Speed Readout in AFM-Based Recording, Journal of Vacuum Science Technology, Vol 18, No. 1, Janurary/February 2000, pp. 94 - 99
	74	*ROBERT P. RIED,* Air-Bearing Sliders and Plane-Plane-Concave Tips for Atomic Force Microscope Cantilevers, Journal of Microelectromechanical Systems, Volume 9, No. 1, March 2000, pp. 52 - 57
	75	*L. RICHARD CARLEY, GREGORY R. GANGER and DAVID F. NAGLE, Mems-Based Integrated-Circuit Mass-Storage Systems,* Communications of the ACM, Volume 43, No., 11, November 2000, pp. 73 - 80
	76	*P. VETTIGER, M. DESPONT, U. DRECHSLER, U. DURIG, W. HABERLE, M. I. LUTWYCHE, H.E. ROTHUIZEN, R. STUTZ, R. WIDMER AND G. K. BINNIG,* The "Millipede" - More than one thousand tips for future AFM data storage, I.B.M. J. Res. Develop., Volume 44, No. 3, May 2000, pp. 323 - 340

		OTHER DOCUMENTS (Include author (if any), title, publisher and place of publication, date and pertinent pages)
	77	*R. B. ZMOOD, L. QIN, D. K. SOOD, T. VINAY and D. MEYRICK,* School of Electrical and Computer System Engineering, Royal Melbourne Institute of Technology, Melbourne, Victoria 3000, Australia, Magnetic MEMS Used in Smart Structures Which Exploit Magnetic Materials Properties, Smart Structures and Devices, Proceeding of the SPIE, Volume 4235, 2001, pp. 173 - 187
	78	*MICHAEL GROSS,* Small is Great!, New Scientist, July 14, 2001, pp. 1 - 4
	79	*G. CHERUBINI, T. ANTONAKOPOULOS, P. BACHTOLD, G. K. BINNIG, M. DESPONT, U. DRECHSLER, A. DHOLAKIA, U. DURIG, E. ELEFTHERIOU, B. GOTSMANN, W. HABERLE, M. A. LANTZ, T. LOELIGER, H. POZIDIS, H. E. ROTHUIZEN, R. STUTZ AND P. VETTIGER,* I.B.M. Research, Zurich Research Laboratory, The Millipede, a Very Dense, Highly Parallel Scanning-Probe Data-Storage System, ESSCIRC 2002, pp. 121 - 125
	80	*E. ELEFTHERIOU, G. CHERUBINI, H. POZIDIS, H. E. ROTHUIZEN AND P. VETTIGER,* Millipede - a MEMS-Based Scanning-Probe Data-Storage System, APMRC 2002, pp. 1 - 8
	81	*SATOSHI KAWAMURA,* Electronics Device Division, Hitachi Maxell, Limited, Coil on Chip RFID System by Super EF2 Technology, Nippon Oyo Jiki Gakkai Kenkyukai Shiryo, Vol. 123, pp. 21 - 25
	82	Molecular Chip Patent, Poptronics, Vol. 3, No. 5, May 2002, pp. 11 - 12
	83	*KENNETH J. KORANE,* A King-Size Future for Nanosize Machines, Machine Design Vol 74, No. 18, September 19, 2002, pp. 88 - 94
	84	*PETER VETTIGER AND GERD BINNIG,* The Nanodrive Project: Inventing a Nanotechnology Device for Mass Production and Consumer Use is Trickier than it Sounds, Scientific American, Vol. 288, No. 1, 2002, pp. 47 - 53
	85	*MUSTAFA UYSAL, ARIF MERCHANT, GUILLERMO A. ALVAREZ,* Hewlett Packard Laboratories, Using MEMs-Based Storage in Disk Arrays, Proceedings of FAST '03: 2nd USENIX Conference on File and Storage Technologies, USENIX Association, pp. 89 - 101
	86	*KIYOSHI, T., ET AL.*, "Switching and memory phenomenon in Langmuir-Blodgett film using a scanning tunneling microscope," Canon, Inc., IEIC Technical Report (1994), Vol. 93, No. 524 (OME93 54-59), pp. 7012, Fig. 6, Ref. 15.
	87	*KIYOSHI T. ET AL.*, Application and Progress in the Scanning Probe Microscopy, High Density Information Storage Using Langmuir-Blodgett Film and Atomic Force Microscopy," Canon, Inc., Journal of the Surface Science Society of Japan (1997), Vol. 18, No. 4, pp. 213-218, Fig. 7, Ref. 14.
	88	*KADO, H. and TOHDA, T.*, "Nanometer-scale recording on chalcogenide films with an atomic force microscope," Appl. Phys./ Lett., Vol. 66, No. 22, 29 May 1995, pp. 2961-2962.
	89	*YANO, K., ET AL.*, "Nanometer scale conductance change in a Langmuir-Blodgett film with the atomic force microscope," Appl. Phys. Lett., Vol. 68, Vol. 2, 8 January 1996, pp. 188-190.
	90	*YANO, K. and IKEDA, T.*, "Stable bit formation in polyimide Langmuir-Blodgett film using an atomic force microscope," Appl. Phys. Lett., Vol. 80, Vol. 6, 11 February 2002, pp. 1067-1069.
	91	*BARRETT, R.C. and QUATE, C.F.*, "Large-scale charge storage by scanning capacitance microscopy," Ultramicroscopy 42-44 (1992) pp. 262-267.
	92	*GARDNER, E.*, "AFM Fabricates a Tiny Transistor," Science, Vol. 266, 28 October 1994, p. 543.
	93	*HAGAN, H.P.*, et al., "Temporal behaviour of nanofeatures on Au," Ultramicroscopy, 42-44 (1992), pp. 587-593.

OTHER DOCUMENTS (Include author (if any), title, publisher and place of publication, date and pertinent pages)		
	94	*MAJUMDAR, A., ET AL.*, "Nanometer-scale lithography using the atomic force microscope," Appl. Phys. Lett., Vol. 61, No. 19, 9 November 1992, pp. 2293-2295.
	95	*MAMIN, H.J. and RUGER, D.*, "Thermomechanical writing with an atomic force microscope tip," App. Phys. Lett., Vol. 61, No. 8, 24 August 1992, pp. 1003-1005.
	96	*MAMIN, H.J., ET AL.*, "High Density data storage using proximal probe techniques," The IBM Journal of Research and Development, Vol. 39, No. 6, November 1995, pp. 681-699.
	97	*MANALIS, S., ET AL.*, "Submicron studies of recording media using thin-film magnetic scanning probes," Applied Physics Letters, Vol. 66, No. 19, 8 May 1995, pp. 2585-2587.
	98	*TERRIS, B.D., ET AL.*, "Atomic force microscope-base data storage: track servo and wear study," Applied Physics A Vol. 66, pp. S809-S813 (1998), (IBM Almaden Research Center, presented STM 97).
	99	*UESUGI, K. and YAO, T.*, "Nanometer-scale fabrication on graphite surfaces by scanning tunneling microscopy," Ultramicroscopy, 42-44 (1992), pp. 1443-1445.
	100	PCT Written Opinion mailed December 18, 2000, International Application No. PCT/US99/30326, filed December 20, 1999
	101	*T.C. SHEN ET AL;* Ion irradiation effects on graphite with the scanning tunneling microscope; J.Vac.Sci. Technol. B9(2), Mar/Apr 1991; pp.1376-1379
	102	*U. STAUFER ET AL;* Tailoring nanostructures with a scanning tunneling microscope; J.Vac.Sci. Technol. B9(2), Mar/Apr 1991; pp.1389-1393
	103	*H.J. MAMIN;* Gold deposition from a scanning tunneling microscope tip;, et al.; J.Vac.Sci. Technol B9(2), Mar/Apr 1991; pp.1398-1402
	104	*J.A. DAGATA, ET AL.* Pattern generation on semiconductor surfaces by a scanning tunneling microscope operating in air;; J.Vac.Sci. Technol. B9(2), Mar/Apr 1991; pp.1384-1388
	105	*T.R. ALBRECHT, ET AL.* Nanometer-scale hole formation on graphite using a scanning tunneling microscope,; Appl.Phys.Lett., Vol.55, No.17, 23 October 1989; pp.1727-1729
	106	*M.AONO*; Has Japan Begun to Move Toward Atomic Level Material Processing?; Science, Vol. 258; 23 October 1992

Examiner	Date Considered

*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

*1 = Copy not submitted because it was submitted in prior application SN _/______, filed __________, 20___, relied on under 35 USC §120.
*2 = Copy not submitted because it was submitted in prior application SN _/______, filed __________, 20___, relied on under 35 USC §120.